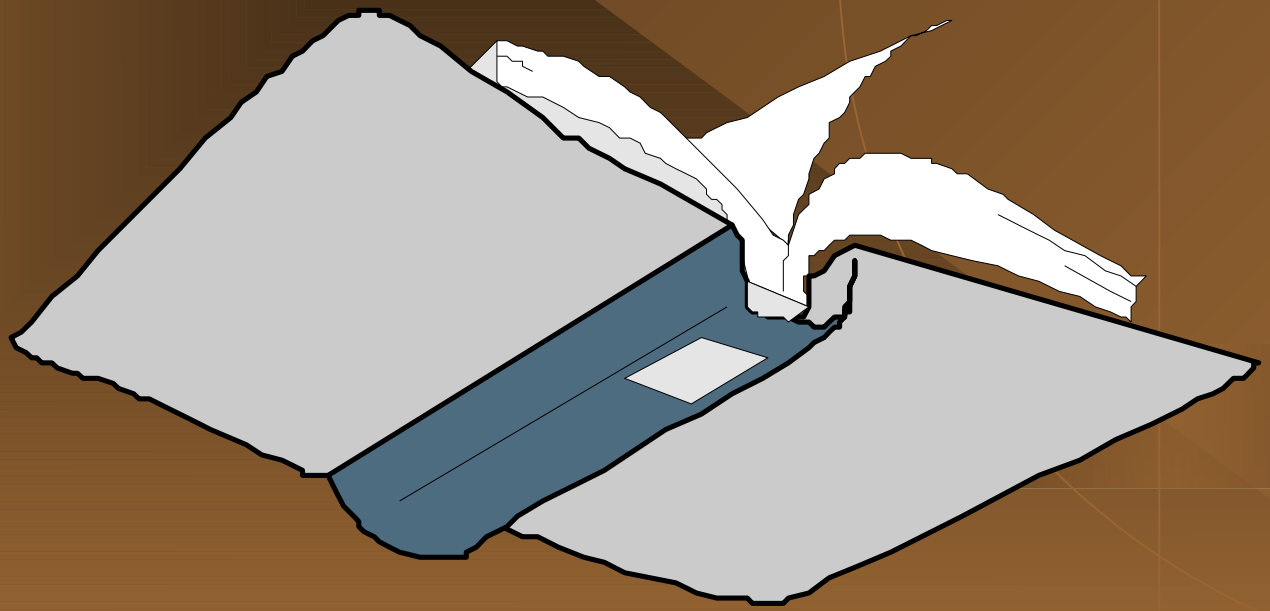
# GAS FREE ENGINEER AND GAS FREE ENGINEERING PETTY OFFICER FOR SURFACE AFLOAT OPERATIONS

(K-495-0051)

# Lesson Topic 1.1

## NSTM 074 VOL. 3 (SERIES) FAMILIARIZATION



# Introduction

As Gas Free Engineer Personnel you
will be required to know the
information provided in the NSTM 074,
Vol. 3 series.

# Enabling Objectives

- Describe the different sections of the 074 Vol. 3 in accordance with NSTM Chapter 074 Vol. 3, Gas Free Engineering

# Section 18, Gas Free Engineering Program Requirements

- GFE background
- Legal Provisions for Training
- Program Evaluation and Recertification
- Contractor Operations

# Section 19, Gas Free Engineering Procedures

- The need for Gas Freeing
- Sources of Confined Space Hazards
- Entry and Work Restrictions for Confined Spaces
- Working alone
- Exposure Levels

# Section 19, Gas Free Engineering Procedures (Cont'd)

- Personnel Protective Equipment (PPE)
- Respiratory Protection
- Breathable Air
- Access to Hazardous Spaces
- Testing Procedures and Resulting Restrictions

# Section 19, Gas Free Engineering Procedures (Cont'd)

- Periodic and Continuous Testing
- Conditions for Classifying Confined Spaces as IDLH
- IDLH Space Entry

# Section 20, Navy Gas Free Certificates

- Spaces initially certified by the GFEPO, GFEA, and GFE
- Spaces delegated by GFE/GFEA
- Certificate issuance
- Certification and Test Log usage
- Definitions for existing conditions
- Retesting and recertifying spaces

# Section 21, Ventilation

- The types of ventilation and ventilation requirements for specific operations.

# Section 22, Hot Work

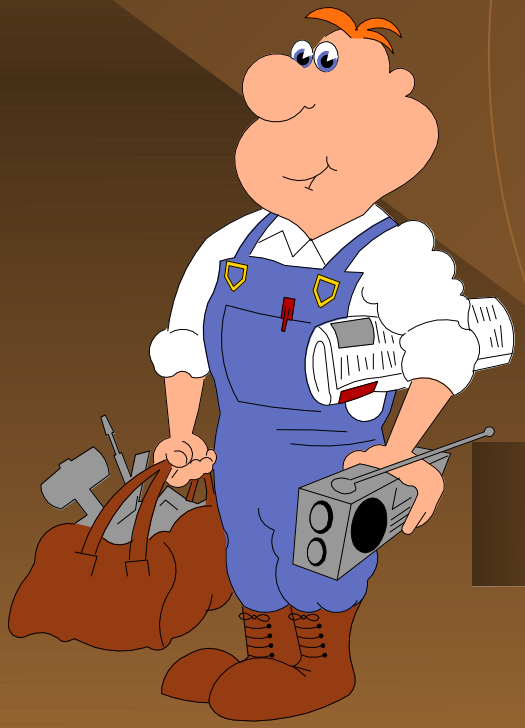
- Requirements / precautions for conducting hot work in or near hazardous and explosive locations.

# Section 23, Space Cleaning

- Various cleaning methods and safety precautions.

# Section 24, Inerting, Pressing-up, and Steam Blanketing

- Restrictions and requirements



# Section 25, Emergency Rescue Procedures

- Responsibilities of Rescue Personnel
- Equipment
- Entry Procedures
- Rescue Procedures
- Attending to victims
- Rescue Personnel Training

# Section 26, Post-Fire Atmospheric Testing

- Testing requirements on Surface ships and Submarines
- Locations for Atmospheric testing

# Section 27, Navy Gas Free Instrumentation

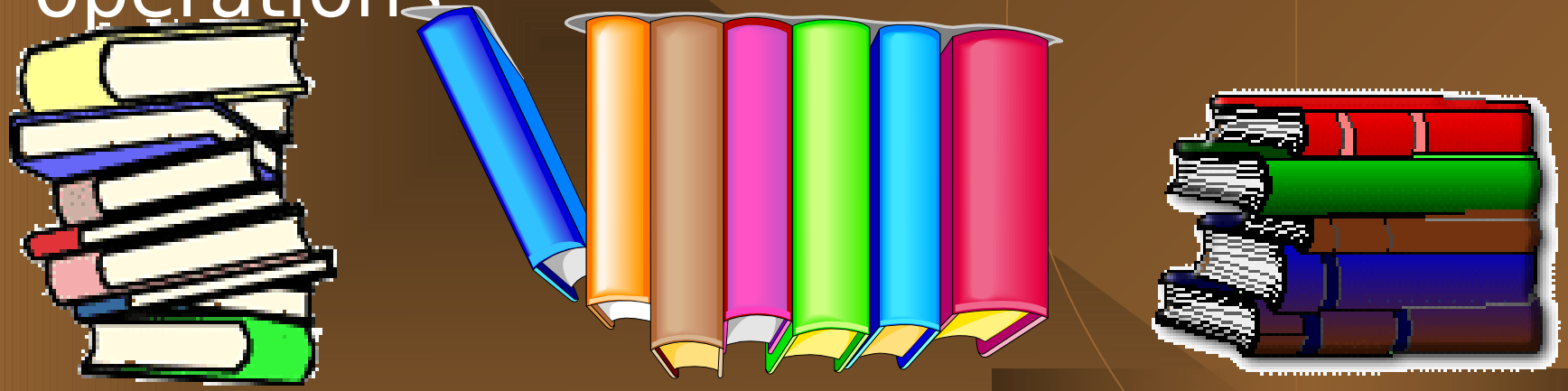
- Approved instruments
- Instrument limitations
- Calibration and maintenance
- Four Gas Analyzer
- Safety precaution
- Maintenance

# Glossary

- Terms and definitions associated with Gas Free Engineering

# Appendix A, GFE Information sources (shipboard)

- Lists 71 publications to be used as references when conducting GFE operations



# Appendix B, Introduction to Shipboard Gas Free Engineering

- Provides outline materials for teaching the basics of gas free engineering.

# Appendix C, Sample Gas Free Engineering Notebook

- Sample of a Ship's gas free instruction
- Section for active gas free chits
- Section for inactive gas free chits
- Gas Free Engineering procedural working guide
- IDLH space emergency entry checklist
- Closed Compartment Opening Request Form

# Appendix D, Navy Gas Free Certificate and Test Log

- Contains the Gas Free certificate and Test Log

SERIAL #_____

NAVY GAS FREE CERTIFICATION AND TEST LOG

**INITIAL CERTIFICATION**

SHIP/UNIT/ACTIVITY:_____

ITEM/COMPARTMENT/SPACE:_____

TYPE OF OPERATION TO BE CONDUCTED:_____

INITIAL DATE OF TEST: HOUR:_____, DATE:_____

INITIAL EXPIRATION: HOUR:_____, DATE:_____

VENTILATION REQUIRED: YES NO

TYPE: _____

INERTED GAS:_____(gas)

OR

PRESSED UP WITH:_____(liquid)

REQUIREMENTS/CONCLUSIONS/PRESCRIBED PRECAUTIONS/INSTRUCTIONS

**GAS RELATED HOT WORK**

PQS QUALIFIED FIRE WATCHES ASSIGNED

| LOCATIONS | PRINT NAME/RATE | SIGNATURE (upon completion) |
|---|---|---|
| | | |
| | | |
| | | |

FINAL CHECKUP, WORK AREA AND ALL ADJACENT AREAS TO WHICH SPARKS AND HEAT MIGHT SPREAD WERE INSPECTED 30 MINUTES AFTER THE WORK WAS COMPLETED AND WERE FOUND TO BE FIRE SAFE. THE EQUIPMENT AND STRUCTURES WORKED ON WERE COOL TO THE TOUCH.

TIME SECURED_____

I CERTIFY THAT I AM FAMILIAR WITH AND WILL COMPLY WITH ALL SAFETY PRECAUTIONS PERTINENT TO THIS TYPE OF WORK.

HOT WORK OPERATER SIGNATURE_____

HOT WORK SUPERVISOR_____

FIRE MARSHAL_____

**TEST RESULTS**

| TESTS CONDUCTED AS REQUIRED | INITIAL TEST | 1st RETEST | 2nd RETEST |
|---|---|---|---|
| OXYGEN | | | |
| COMBUSTABLE GAS | | | |
| TOXIC TYPE: | | | |
| TOXIC TYPE: | | | |
| TOXIC TYPE: | | | |
| TOXIC TYPE: | | | |

| EXISTING CONDITIONS | INITIAL TEST | 1st RETEST | 2nd RETEST |
|---|---|---|---|
| NOT SAFE FOR PERSONNEL/ NOT SAFE FOR HOT WORK | | | |
| NOT SAFE FOR PERSONNEL WITHOUT PROTECTION/ NOT SAFE FOR HOT WORK | | | |
| SAFE FOR PERSONNEL/ NOT SAFE FOR HOT WORK | | | |
| SAFE FOR PERSONNEL/ SAFE FOR HOT WORK | | | |
| NOT SAFE FOR PERSONNEL INSIDE/SAFE FOR HOT WORK OUTSIDE | | | |

NOTE: THIS INSPECTION INDICATES THE CONDITIONS THAT EXISTED AT THE TIME THE TESTS WERE CONDUCTED

GFE PERSONNEL SIGNATURE _____

CO SIGNATURE, If required _____

**RECERTIFICATION**

1st RETEST/UPDATE TIME:_____, DATE:_____, EXPIRES:_____

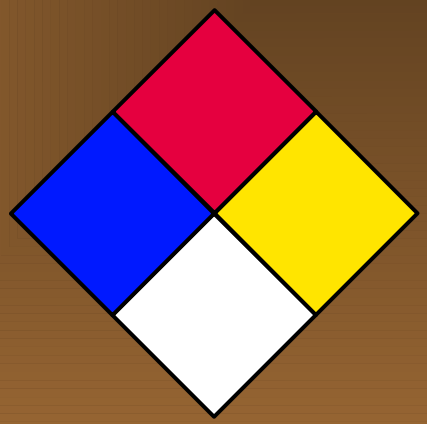
GFE PERSONNEL SIGNATURE_____

2nd RETEST/UPDATE TIME:_____, DATE:_____, EXPIRES:_____

GFE PERSONNEL SIGNATURE_____

# Appendix E, Shipboard Hazardous Atmospheres and Compartments Identification Tables

- Provides guidance for identifying hazardous atmospheres and comp ship.



# Appendix F, How to Read Material Safety Data Sheets (MSDS)

**NOTE: Always be sure you are using t latest version of an MSDS.**

**NOTE: An MSDS does not have to follo any specific format but each has to provide the same kind of information.**

# Appendix F, How to Read Material Safety Data Sheets (MSDS)

- Contains descriptions of eight sections into which the MSDS's are divided.

# Appendix F, How to Read Material Safety Data Sheets (MSDS)

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6. Section VI - Health Hazard Data

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5. Section V - Reactivity Data
6. Section VI - Health Hazard Data
7. Section VII - Precautions for safe handling and use

# Appendix F, How to Read Material Safety Data Sheets (MSDS)

...and last but not least,

- Section VIII - Control Measures

# Appendix G, Permissible Exposure Limits

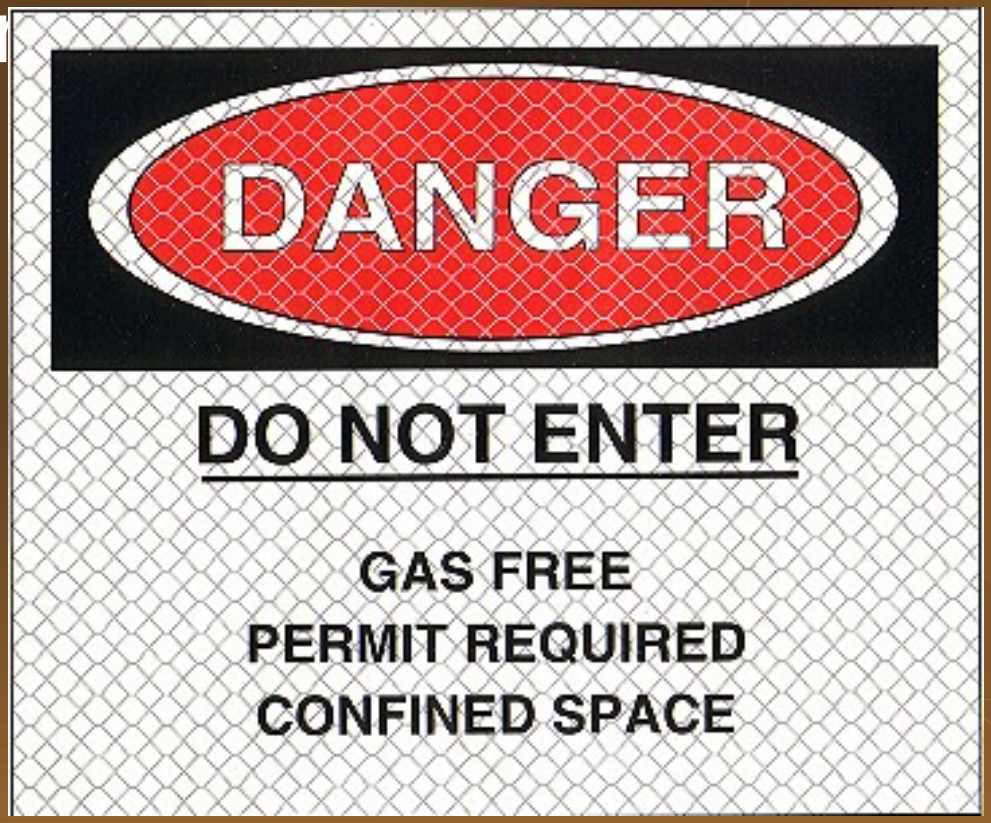
- Contains a wide range of chemical names with their PEL and IDLH limits

# Appendix H, Gas Free Engineering Equipment References

- Contains a quick reference listing of many types of gas free equipment and protective clothing

# Appendix I, Approved GFE Signage

- Contains illustrations of approved Gas Free Sig



# Appendix J, Metric Conversion Charts

- Celsius - Fahrenheit and Volume

# Appendix K, Portable Gas Free Instrument Certification

- Standards for gas free instruments
- Provides a list of gas free equipment

# Appendix L, Chemical Detection Tubes

- System components, testing process, care and maintenance of detector tube systems.

# REVIEW AND SUMMARY

# Review and Summary

- Section 18 ?
- Section 19 ?
- Section 20 ?
- Section 21 ?
- Section 22 ?
- Section 23 ?

# Review and Summary

- Section 24 ?
- Section 25 ?
- Section 26 ?
- Section 27 ?
- Glossary
- Appendices A - L ?

# THE END